

**ACCESSORY FOR A LADDER**

**BACKGROUND OF THE INVENTION**

**1. Field of the Invention**

The present invention relates to the general art of  
5 ladders, and to the particular field of accessories for  
ladders.

**2. Discussion of Related Art**

Ladders are one of the most common items used in the  
construction and building arts. Often, a user must use a  
10 ladder to reach a wide range of locations for a single job.  
In such an instance, the ladder must be moved from place to  
place. Stocking shelves, moving books and the like are  
examples of jobs that may require a ladder to be moved after  
it has initially been placed in a desired location. This may  
15 require the user to descend the ladder to move it to the  
next location and then ascend the ladder to complete the  
work at that location.

This can be a time consuming task and may be tiring  
since the user sometimes must ascend and descend the ladder  
20 several times to complete a job. Since time is wasted going  
up and down a ladder, completion of a job may take more time

than necessary. This can be costly as well as time consuming.

Therefore, there is a need for a means for moving a ladder without requiring a user to dismount from the ladder.

5 Safety is an important consideration when using a ladder as an error could result in a long and dangerous fall. Therefore, there is a need for a means for moving a ladder without requiring a user to dismount from the ladder, which can be used in a safe manner.

A workman may have several ladders so different jobs can be accommodated. To be cost effective, any accessory should be amenable to use on a variety of ladders. However, since safety is such an important consideration, safety should not be compromised by use of an accessory on any ladder.

Therefore, there is a need for a means for moving a ladder without requiring a user to dismount from the ladder and which is amenable for use on a variety of ladders without sacrificing safety considerations.

20 PRINCIPAL OBJECTS OF THE INVENTION

It is a main object of the present invention to provide a means for moving a ladder without requiring a user to dismount from the ladder.

It is another object of the present invention to provide a means for moving a ladder without requiring a user to dismount from the ladder, which can be used in a safe manner.

5 It is another object of the present invention to provide a means for moving a ladder without requiring a user to dismount from the ladder and which is amenable for use on a variety of ladders without sacrificing safety considerations.

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#### SUMMARY OF THE INVENTION

These, and other, objects are achieved by an accessory for a ladder which comprises: a plurality of wheels, each wheel having an attaching mechanism thereon which attaches the wheel to the foot of a ladder when the wheel is in use; 15 an element that attaches two wheels of the plurality of wheels together when the two wheels are in place on the ladder; a gear mechanism mounted on one wheel of the two wheels, the gear mechanism including a gear wheel mounted on the one wheel, the gear wheel including a plurality of gear teeth; and an operating handle that has a distal end sized 20 to engage the gear teeth of the gear wheel to rotate the gear wheel.

Once the user has ascended the ladder, the user need

not descend the ladder and dismount the ladder in order to move the ladder to a new location. Movement of the ladder can be effected by the user operating the control handle while the user is still on the ladder. This saves time that 5 would otherwise be wasted by the user descending the ladder, dismounting the ladder, moving the ladder to a new location, then re-ascending the ladder. Safety is achieved by moving the ladder in very small steps. The accessory embodying the present invention can be easily and quickly moved from one 10 ladder to another and thus is amenable for use with a wide variety of ladders, yet will retain the safety features associated with the accessory.

#### BRIEF DESCRIPTION OF THE DRAWING FIGURES

Figure 1 is a perspective view of a portion of a ladder 15 having the accessory embodying the present invention mounted thereon.

Figure 2 is an enlarged cross-sectional view taken along line 2-2 of Figure 1.

Figure 3 is an enlarged perspective view of a wheel 20 that can be used in connection with a set of ladder legs.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Other objects, features and advantages of the invention

will become apparent from a consideration of the following detailed description and the accompanying drawings.

Referring to the Figures, it can be understood that the present invention is embodied in an accessory 10 for a ladder L that is used to move the ladder without requiring a person to descend from the ladder whereby the ladder can be moved by the person while he or she remains on the ladder.

Accessory 10 comprises a set of wheels adapted to be mounted on the feet F of a ladder. The set of wheels includes a first wheel 12, a second wheel 14, and third and fourth wheels, such as third wheel 16 shown in Figure 3. Each of the wheels is identical to the other wheels and each wheel has a cylindrical body 16 that can be constructed of rubber or other suitable material, and which has an outer surface 18. Each wheel further includes a first end 20, a second end 22, and a longitudinal axis 24 which extends between the first end 20 and the second end 22.

An axial bore 30 extends along the longitudinal axis 24 between the first end 20 and the second end 22, and longitudinal ribs, such as rib 32, are located on the outer surface 18 of the cylindrical body 16. The longitudinal ribs 32 extend from the first end 20 to the second end 22 of the body 16.

A U-shaped bracket 40 is fixed to each of the wheels.

Each U-shaped bracket 40 includes a bight section 42, which has a first end 44 and a second end 46. The first end 44 of the bight section 42 is located adjacent to the first end 20 of the wheel associated with the bracket 40 and the second end 46 of the bight section 42 is located adjacent to the second end 22 of the wheel associated with the bracket 40. The bight section 42 further includes a first surface 48 located closely adjacent to the wheel associated with the bracket 40 and a second surface 50.

A first leg 52 is located on the first end 44 of the bight section 42. The first leg 52 is located closely adjacent to the first end 20 of the wheel associated with the bracket 40. The first leg 52 has a proximal end 54 that is unitary with the bight section 42 and a distal end 56 that is located closely adjacent to the axial bore 30 in the wheel associated with the bracket 40. The first leg 52 has an axle-accommodating hole 58 defined therethrough in the distal end 56 thereof. The axle-accommodating hole 58 is aligned with the axial bore 30 in the wheel associated with the bracket 40.

A second leg 60 is on the second end 46 of the bight section 42. The second leg 60 is located closely adjacent to the second end 22 of the wheel associated with the bracket 40. The second leg 60 has a proximal end 62 that is unitary

with the bight section 42 and a distal end 64 that is located closely adjacent to the axial bore 30 in the wheel associated with the bracket 40. The second leg 60 has an axle-accommodating hole 66 defined therethrough in the 5 distal end 64 thereof. Axle-accommodating hole 66 is aligned with the axial bore 30 in the wheel associated with the bracket 40.

A first L-shaped mounting element 70 is located on the second surface 50 of the bight section 42 adjacent to the 10 first end 44 of the bight section 42 of the bracket 40. The first L-shaped mounting element 70 includes a body 72 having a proximal end 74 and a distal end 76. Proximal end 74 is unitary with the bight section 42 of the bracket 40, and the distal end 76 of the body 72 of the first L-shaped mounting 15 element 70 is spaced apart from the second surface 50 of the bight section 42 of the bracket 40.

A longitudinal axis 80 extends between the distal end 76 of the body 72 of the first L-shaped mounting element 70 and the proximal end 74 of the body 72 of the first L-shaped 20 mounting element 70. Longitudinal axis 80 of the body 72 of the first L-shaped mounting element 70 is oriented at a right angle with respect to longitudinal axis 24 of the bight section 42 of the bracket 40.

The body 72 of the first L-shaped mounting element 70

further includes a first surface 82 and a second surface 84.

A first L-shaped mounting element fastener accommodating hole 86 is defined through the body 72 of the first L-shaped mounting element 70 from the first surface 82 to the second surface 84 near the distal end 76 of the body 72 of the first L-shaped mounting element 70. The body 72 of the first L-shaped mounting element 70 has a screw thread 88 defined thereon adjacent to the fastener accommodating hole 86 of the first L-shaped mounting element 70.

A head 90 is unitary with the distal end 76 of the body 72 of the first L-shaped mounting element 70. Head 90 has a proximal end 92 unitary with the distal end 76 of the body 72 of the first L-shaped mounting element 70 and a distal end 94 spaced apart from the distal end 76 of the body 72 of the first L-shaped mounting element 70. Head 90 also includes a longitudinal axis 96, which extends between the proximal end 92 of the head 90 and the distal end 94 of the head 90 and which extends in the direction of the longitudinal axis 24 of the bight section 42 of the bracket 40 towards the second end 46 of the bight section 42 of the bracket 40.

A securing mechanism 100 is on the first surface 82 of the body 72 of the first L-shaped mounting element 70. Securing mechanism 100 includes a mounting element 102

fixedly mounted on the first surface 82 of the body 72 of the first L-shaped mounting element 70. Mounting element 102 of the securing mechanism 100 includes a fastener accommodating hole 104 defined therethrough to be coincident with the fastener accommodating hole 86 defined through the body 72 of the first L-shaped mounting element 70. The securing mechanism 100 further includes a screw thread 106 defined on the body of the securing mechanism 100 adjacent to the fastener accommodating hole 104 defined through the body of the securing mechanism 100. A fastener 110 is accommodated in the fastener accommodating holes 104 defined through the mounting element 102 of the securing mechanism 100 and the hole 86 defined through the body 72 of the first L-shaped mounting element 70. The fastener 110 of the securing mechanism 100 includes a screw thread 112 that is threadably accommodated in the screw thread 106 of the securing mechanism 100 and the screw thread 88 of the first L-shaped mounting element 70. The fastener 110 further includes a first end 114, a second end 116, and a head 120 on the first end 114. The second end 116 of the fastener 110 is adapted to abuttingly engage one surface of a leg of the ladder when the wheel associated therewith is in place on the foot of the ladder.

A second L-shaped mounting element 130 is on the second

surface 50 of the bight section 42 adjacent to the second end 46 of the bight section 42 of the bracket 40. The second L-shaped mounting element 130 includes a body 132 having a proximal end 134 and a distal end 136. Proximal end 134 is unitary with the bight section 42 of the bracket 40 and 5 distal end 136 is spaced apart from the second surface 50 of the bight section 42 of the bracket 40. Second L-shaped mounting element 130 further includes a longitudinal axis 138 which extends between the distal end 136 of the body 132 of the second L-shaped mounting element 130 and the proximal 10 end 134 of the body 132 of the second L-shaped mounting element 130. Longitudinal axis 138 of the body 132 of the second L-shaped mounting element 130 is oriented at a right angle with respect to the longitudinal axis 24 of the bight section 42 of the bracket 40.

Second L-shaped mounting bracket 130 further includes a first surface 140 on the body 132 of the second L-shaped mounting element 130 and a second surface 142 on the body 132 of the second L-shaped mounting element 130.

20 A head 146 is unitary with the distal end 136 of the body 132 of the second L-shaped mounting element 130. Head 146 of the second L-shaped mounting element 130 has a proximal end 148 that is unitary with the distal end 136 of the body 132 of the second L-shaped mounting element 130 and

a distal end 150 spaced apart from the distal end 136 of the body 132 of the second L-shaped mounting element 130. Head 146 of the second L-shaped mounting element 130 includes a longitudinal axis 152 which extends between the proximal end 5 148 of the head 146 of the second L-shaped mounting element 130 and the distal end 150 of the head 146 of the second L-shaped mounting element 130, extending in the direction of the longitudinal axis 24 of the bight section 42 of the bracket 40 towards the first end 44 of the bight section 42 10 of the bracket 40.

As can be understood from Figure 1, when the one end of the fastener 110 of the securing mechanism 100 on the first L-shaped securing element 70 is abuttingly engaged with the leg of the ladder, the U-shaped bracket 40 associated with 15 the securing mechanism 100 is secured to the ladder.

An axle 160 extends through the axial bore 30 in each wheel. The axle 160 is rotatably supported by the first and second legs 52, 60 of the bracket 40 associated with each wheel adjacent to the axle-accommodating holes 58, 66 20 defined in the first and second legs 52, 60 whereby each of the wheels is rotatably mounted on a U-shaped bracket 40 by an axle 160. Each axle 160 has a longitudinal axis 162.

An axle extension 164 extends between the first and second wheels 12, 14. Axle extension 164 includes a first

section 166. First section 166 of the axle extension 164 is aligned with the axle 160 in the first wheel 12. First section 166 of the axle extension 164 includes a proximal end 168 that is unitary with the axle 160 in the first wheel 12 and a distal end 170 that is located between the first wheel 12 and the second wheel 14 when the first and second wheels 12, 14 are attached to the feet of the ladder. The first section 166 of the axle extension 164 extends in the direction of the longitudinal axis 162 of the axle 160 of the first wheel 12 toward the second wheel 14.

Axle extension 164 further includes a second section 180. Second section 164 of the axle extension 164 is aligned with the axle 160 in the second wheel 14. Second section 180 of the axle extension 164 includes a proximal end 182 that is unitary with the axle 160 in the second wheel 14 and a distal end 184 that is located between the first wheel 12 and the second wheel 14 when the first and second wheels 12, 14 are attached to the feet of the ladder. Second section 180 of the axle extension 164 extends in the direction of the longitudinal axis 162 of the axle 160 of the second wheel 14 toward the first wheel 12. The distal end 184 of the second section 172 of the axle extension 164 is telescopingly attached to the distal end 170 of the first section 166 of the axle extension 164 when the axle

extension 164 is in use. A plurality of pin accommodating holes, such as pin accommodating hole 188, are defined in the first section 166 of the axle extension 164 near the distal end 170 of the first section 166 of the axle extension 164. A plurality of pin accommodating holes, such as pin accommodating hole 190, are defined in the second section 172 of the axle extension 164 near the distal end 184 of the second section 172 of the axle extension 164. A pin 192 connects one of the pin accommodating holes 188 in the first section 166 of the axle extension 164 to one of the pin accommodating holes 190 in the second section 172 of the axle extension 164 to attach the first section 166 to the second section 172 of the axle extension 164 when the axle extension 164 is in use.

A gear mechanism 200 is mounted on the first leg 52 of the U-shaped bracket 40 associated with the first wheel 12. The gear mechanism 200 includes an attaching arm 202 that is unitary with the axle 160 associated with the U-shaped bracket 40 associated with the first wheel 12. The attaching arm 202 is L-shaped and has a proximal end 204 that is unitary with the axle 160 associated with the first wheel 12 and a distal end 206 which is offset from the longitudinal axis 162 of the axle 160 associated with the first wheel 12. A gear wheel 210 is rotatably mounted on the distal end

206 of the attaching arm 202 to rotate in a plane that is perpendicular to the longitudinal axis 162 of the axle 160 associated with the first wheel 12. The gear wheel 210 has an outer perimeter 212 and includes a plurality of gear teeth, such as gear tooth 214, on the outer perimeter 212.

5 An operating handle 220 includes a first section 222 which has a distal end 224 and a gear tooth-engaging element 226 on the distal end 224 of the first section 222 of the operating handle 220. The gear tooth-engaging element 226 engaging the gear teeth 214 of the gear wheel 210 to rotate the gear wheel 210. The first section 222 of the operating handle 220 further includes a proximal end 227 and a plurality of pin-accommodating holes, such as pin-accommodating hole 228, defined therein adjacent to the proximal end 227 of first section 222.

10 Operating handle 220 further includes a second section 230 which has a distal end 232, a proximal end 234, and a plurality of pin-accommodating holes, such as pin-accommodating hole 236, defined therein adjacent to the distal end 232 of the second section 230. The first section 222 of the operating handle 220 is telescopingly received in the second section 230 of the operating handle 220 whereby the overall length of the operating handle 220 can be adjusted to accommodate the height of the ladder.

A pin 238 is received through pin-accommodating holes 228, 236 defined in the first and second sections 222, 230 of the operating handle 220 to attach the first section 222 of the operating handle 220 to the second section 230 of the  
5 operating handle 220.

If suitable, an operating handle guide 250 can be mounted on the ladder and the operating handle 220 placed in the guide 250 to ensure easy contact between the operating handle 220 and the gear teeth 214. A foam rubber handgrip  
10 can be included on the operating handle 220 for comfort and a brake and brake handle can also be included. The brake can include a portion that engages at least one wheel 12, 14 or engages the gear teeth 214 to add stability to a ladder that may be used on an incline or on a sloping floor.

15 Operation of the accessory 10 can be understood from the foregoing. The wheels are attached to the feet of the ladder, and the overall length of the operating handle 220 is adjusted as necessary. The user then locates the ladder where suitable and ascends the ladder. If the ladder is to  
20 be moved, the user engages the gear tooth-engaging element 226 with the teeth 214 of the gear wheel 210 to move the teeth 214. Movement of the gear teeth 214 rotates gear wheel 210 which rotates the axle 160 extending through the first wheel 12 which rotates the axle extension 164 and the second

wheel 14. Rotation of these two wheels 12, 14 moves the ladder. The operating handle 220 is moved again and again until the ladder is located where the user desires.

It is understood that while certain forms of the  
5 present invention have been illustrated and described  
herein, it is not to be limited to the specific forms or  
arrangements of parts described and shown.